

Daniel Dennett - why are we here?

Ten thousand years ago the human population plus livestock and pets would have weighed less than 1% of biomass. Today it is 98%. In 10,000 years we have overwhelmed the planet. We have done this because of our understanding. Daniel Dennett discusses our success as a species, and the evolution of culture and language which has allowed us to dominate and now threaten the planet.

HIDE TRANSCRIPT

Transcript

Robyn Williams: This is the philosopher Daniel Dennett who actually took the trouble to train himself in neuroscience so that he could understand the brain. Here he is trying to answer the question; must it always be a big thing that makes a smaller thing? And the juiciest question of all; why are we here?

Daniel Dennett: I think I know why I'm here. The great thing about Darwin is the reason why we can take, in effect, all of human intellectual history and talk about the pre-Darwinian and the post-Darwinian world view is easy enough to see. The pre-Darwinian world view is what I call the trickledown theory of creation. It takes a big fancy intelligent thing to make a lesser but still marvellous thing. I think this idea may, in a certain sense, predate our species. Maybe *Homo habilis*, the tool maker, had some faint appreciation of the fact that it takes a big fancy thing to make a lesser thing. You never see an axe making an axe-maker, you never see a pot making a potter, it's always the other way around.

And so it seemed just obvious to everybody until along came the bubble-up theory of creation, and that was Darwin's. One of his early critics summed it up in a passage that is one of my favourites:

'In the theory with which we have to deal, Absolute Ignorance is the artificer; so that we may enunciate as the fundamental principle of the whole system, that, in order to make a perfect and beautiful machine it is not requisite to know how to make it. This proposition will be found, on careful examination, to express, in condensed form, the essential purport of the Theory, and to express in a few words all Mr Darwin's meaning; who, by a strange inversion of reasoning, seems to

think absolute ignorance fully qualified to take the place of absolute wisdom in all the achievements of creative skill.'

Indeed! Exactly right, he's got it! I am amused some people laugh...they still don't realise; yes, that's the point. That is the point of Darwin's theory and it is indeed a strange inversion of reasoning. A creationist pamphlet highlights just how obvious it seems that this can't be right. Do you know of any car that didn't have a maker? If you answered 'yes' for any of the above, give details! This is a very counterintuitive idea that Darwin puts forward. It's very easy to understand the idea but for many people it is just impossible to accept.

Here's another famous Brit, Alan Turing, and he had his own strange inversion of reasoning, and they're very similar, I want to draw attention to them. In the old days computers had to understand arithmetic. They had to appreciate the reasons for mathematical exercises that they engaged in, and Turing recognised that this was not necessary.

So let's look at the comparison between Darwin's dangerous idea and Turing's. In order to be a perfect and beautiful computing machine it is not requisite to know what arithmetic is. You put the two together and what you get is the appreciation for the first time in the history of human thinking that there can be magnificent competence without comprehension. This flies in the face of what we tend to believe. We think, well, you have to teach people so that they understand things because their competence flows from their understanding, and in general of course that's true, that's why we have education. But it is not true everywhere and what Darwin and Turing showed is that in the end or in the beginning it is competence without comprehension that creates competence with comprehension. Understanding (mind, consciousness, intention) is the effect not the cause.

I call these the free floating rationales of evolution, and they are everywhere. There are reasons for the details of the shapes of proteins, there are reasons for the arrangements of parts within cells, there are reasons why the eagle's wing is the shape it is, and so forth throughout the biosphere. Paley was right about that. There is design aplenty at every scale in the biosphere. It's just that until we came along those reasons were not represented anywhere.

One of my favourite examples is the cuckoo chick. As you know, the cuckoo is a brood parasite, they don't make their own nests. What happens is that when the cuckoo mother is ready to lay her eggs she finds a host's nest, waits until the host have laid their eggs and then flown away, then she swoops down, lays her egg covertly, typically rolls one of the host's eggs out (that's in case the hosts can count; there is a reason!). The hosts come back and incubate the cuckoo along with their own. And when the cuckoo is born, typically before the other eggs are hatched, the first thing it does is try to roll the other eggs out of the nest and it often succeeds. The reason for this is unmistakable; it is maximising its own benefit from its hosts. But the little cuckoo doesn't understand that, doesn't have to understand that. This is competence without comprehension.

Then along came us. Ten thousand years ago...this is a calculation that Paul MacCready, the late, great, green, visionary engineer made a few years ago. Ten thousand years ago, if you took the human population, plus their livestock and pets...this is shortly after the dawn of agriculture...if you took all their pets, all their livestock and then put them on a scale and weighed them against all the other animals on the planet, the terrestrial vertebrates, not the insects, not the worms and not the fish in the sea...at that point our ancestors plus their livestock represented, he calculates, less than 1% of the biomass by weight. What do you suppose it is today? Any guess? I hear 90%, I hear 10%...22%. It's 98%. We have engulfed the planet in 10,000 years. That is a biological phenomenon of stunning swiftness. Here's what he has to say about it:

'Over billions of years, on a unique sphere, chance has painted a thin covering of life; complex, improbable, wonderful, and fragile. Suddenly we humans have grown in population, technology and intelligence to a position of terrible power: we now wield the paintbrush.'

And that's true, we do, and we do because we can, and we can because we comprehend.

John Maynard Smith and Eörs Szathmáry in their wonderful book *The Major Transitions* list five major transitions. I'm going to concentrate on the last two, language and human

culture, because it's in our species and it's only in our species that these transitions have occurred. They might occur in some other species.

It is a truism that it's human culture, technology, intelligence, that has produced this 10,000-year explosion, the MacCready explosion, and the traditional model of this has got this one problem; who invented words? Who invented arithmetic, who invented music? Who invented maps? And the answer is; nobody. Who invented money? Nobody invented these things. Well, but then how did they get to be such perfect tools for the jobs that they do? And the answer of course is that they evolved. They evolved just the way that animals and plants and viruses do, they evolved by natural selection. That's the only way that such excellent designs could get accomplished in this world.

What I'm talking about of course is what Richard Dawkins calls memes. Memes are analogous to genes, they are the replicable items in the cultural sphere, or to viruses. What's a virus? A virus is just some nucleic acid with attitude. It's not alive, but it surely does replicate and it surely is subject to evolution. A meme is a data structure with attitude. It's made of information, and like a virus it has the wonderful property (and it doesn't have to have any comprehension to do this) of provoking its own replication when it gets in human heads.

We're all familiar with the tree of life, with phylogenetic trees. Interestingly, before there were phylogenetic trees there were glosso-genetic trees worked out by great scholars of the history of language, and there are the proto-Indo-European languages, the Finno-Ugric, the languages of China, the proto-Mayan languages. All of these languages have clear glosso-genetic trees that trace back their ancestry.

There's a problem with them and it's remarkably similar to the problem with the tree of life in general and that is just as in horizontal gene transfer which messes up the tree of life in the early eons of life on this planet, so there's tremendous horizontal word transfer. All the words in English that come from French, for instance, even though French and English split off many hundreds and hundreds of years ago, thousands actually...so it's words that are more trackable items than whole languages, but words have ancestries too,

and words are memes that can be pronounced.

Richard Dawkins the other day spoke about the fifth bridge, and that was what he called digital Darwin, the digitisation of evolution as we understand it, and I want to point out that language is also digitised in exactly the same sense. What do you see? 'The cat'. But notice that the 'h' and the 'a' are exactly the same shape, and yet automatically, without meaning comprehension you change the 'h' and the 'a' and turn it into 'the cat'. This is correction to a norm, this is the essence of digitisation, it's where you get high quality replication.

That was written language but it's even more dramatic, I suppose, in spoken language. So, a little exercise; I want you to listen very carefully and then repeat after me. Are you ready? Here we go. 'Mundify the epigastrium'. Again. Once more. Do you know what it means? No, you don't need to. You don't even have to know if it means anything. All right, here's example two. Are you ready? '[indecipherable garble]' All right, now do it again. You can't do it, can you? And it's not because of a problem with your ears or because I spoke softly or anything like that, it's that you didn't have the set of norms of pronunciation, phonemes, that automatically fixed everything and made it into a memorable, indeed almost unforgettable little pattern in your head.

That is digitisation, and without it language would not have the tremendous power it has. That's why although chimpanzees have some cultural transmission, it never builds, it can't ramify the way human culture can because although a chimp can copy another chimp with a termite fishing stick or something like this, basically for that chimp it's all '[indecipherable garble]'. They can't articulate it and digitise it, and that's why only in one species has culture really gone viral. There are norms of correction.

Here's a completely different example. Information about kayaks is stored in Inuit brains but also in their kayaks, only on the default presumption that the design is good, even if it isn't understood. This is a kind of digitisation. And thank you Peter Godfrey-Smith for drawing attention to a beautiful quote, not about Inuit kayaks but about Polynesian war canoes: 'Every boat is copied from another boat... it is the sea

herself who fashions the boats, choosing those which function and destroying the others.' This is evolution by natural selection without genes.

Memes are like software viruses, in fact I want to say they are software viruses, but to understand this you need to adjust your imagination about both computation and software and I don't have the time to massage your imagination about that today, so I'm just going to go on and compare the prevailing wisdom where culture is seen as composed of good things that are invented by innovators with insight, recognised and valued as such by adopters, this is a sort of economic model of possessions. We save the good stuff, pass it on, protect it and so forth, and indeed a lot of culture is of that form.

But the Darwinian memetic model is much more general. Culture is composed of good, bad and indifferent things, created by processes with variable insight, sometimes a lot, sometimes none at all, adopted with variable recognition of value. Sometimes people don't even realise they're adopting anything. Having an economic model then just is a limiting case. The traditional model is not ruled out, it is simply a limiting case in the spectrum of possibilities.

So if we look at them together, side by side, we see that the traditional model says culture consists of good things, treasures. The Darwinian model says good, bad and indifferent. They're invented with insight, you know, Shakespeare and Einstein and all those other great heroes of culture. Darwin says no, there's sometimes a lot of insight, most of the time not. They're valued according to the traditional...well, sometimes, but sometimes they're even disvalued but they're just pernicious, they are truly viral and you can't get rid of them.

They are passed on in both cases with improvements on the traditional progressive view of culture. The Darwinian view is, well, with mutations, some of them good, some of them bad. So the economic model of the traditional view is simply a limiting case in the Darwinian view.

Darwin begins *The Origin* with a wonderful pedagogical device, he describes what he calls methodical selection, animal and plant breeding. Then he goes on to unconscious selection

where the domesticators don't know what they're doing, but still their behaviour has a direct influence on the trends that happen. And then he gets rid of mind altogether and says then there's natural selection. Of course in our own day we've added a fourth; genetic engineering. It's another way in which designs change thanks to human intervention.

Let's put them in the right order temporally. First there was natural selection, then there was unconscious selection, then methodical selection and now genetic engineering. The same thing is true in meme land. There are memes that were naturally selected, we might think of them as synanthropic. They're like pigeons and squirrels and barn swallows; they're wild but they are evolved by natural selection unguided by human interference to thrive in human company.

There's unconscious selection, like the differential replication of tunes, what the Germans call 'ear worms', those tunes you can't get out of your head. There is the methodical selection of domesticated memes, like calculus, which is not particularly catchy. It's a meme but it only reproduces with a lot of hard effort on the part of its stewards. And we have memetic engineering, otherwise known as spin doctoring, advertising, propaganda, et cetera.

Once we have our cultural software installed, this changes the process of creation that is possible on this planet, and it permits us, for the first time, certain sorts of top-down patterns of causation where the reasons can have an effect on the design directly. I think one of the people who has been most articulate and imaginative on this is my friend and colleague Doug Hofstadter in his book *I am a Strange Loop*. Our minds can be dominated or driven by an idea or by ideas. This is what has happened for the first time with us, and this is the fulcrum of intelligent design.

There are reasons why every little bit of mud is where it is in the case of the termite hill, but in the case of the Gaudi creation, he represented those reasons, he thought it out and he directed from the top down. The workers were given directions by an intelligent designer, which is exactly not what happened in the case of the termites.

Amazingly, wonderfully, one of my favourite examples of top-down design is Turing's computer. He had the whole vision of

that computer before it was ever built. It was because he had worked it out in his head that there was ever initiated the process to make the actual artefact. We are the first intelligent designers in the tree of life. Our natural tendency to interpret all design as top-down (remember, that's the pre-Darwinian world view), that natural tendency as being representation-driven is both anachronistic and anthropocentric. A certain text says 'in the beginning was the word'. No, no. Words are a very recent invention, one of the most recent products of blind, purposeless, absolutely ignorant natural selection.

There is no work for an intelligent artificer god to do. Well, you want to retreat then to a deist god? Well, you can. I agree with those who say there's no logical argument proving there isn't a deist god, so retreat to a deist god if you must, but it is, in a word, lame.

When I dress up I usually have this little Darwin pin on my lapel, and one time I was at a meeting and Murray Gell-Mann the physicist, who knows everything, spotted it and he said, 'Oh Dan, that's very nice, I like your Darwin pin. You know, the original Christian fish symbol is the first acronym. It's *ichthys*, the word for fish, that's why they used the fish. What does *ichthys* stand for? It stands for *Iesous Christos Theou Yios Soter*, 'Jesus Christ, God's Son and Saviour'. Interesting. I said, 'That's wonderful Murray.' He says, 'What I want to know is what does 'Darwin' stand for?'

Well, I'm not a classical scholar but I did have some high school Latin, so I said, 'Give me a cup of coffee and I'll come back to you in half an hour, I'll tell you what it stands for.' And I worked out something which I'm actually pretty proud of, and here it is. It's in Latin, and there's no 'w' in Latin so you have to use 'uu'. So what does 'Daruuin' stand for? It stands for...I'll give you the Latin first so that the classical scholars here can figure it out for themselves: *Delere auctorem rerum ut universum infinitum noscas*, 'Destroy the author of things in order to understand the infinite universe.' Thank you for your attention.

Robyn Williams: Daniel Dennett, professor of philosophy at Tufts University and author of *Darwin's Dangerous Idea*, speaking at the Darwin Festival in Cambridge.

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what are these?

Guests

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<http://ase.tufts.edu/cogstud/incbios/dennettd/dennettd.htm>

Publications

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